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Investigating the relationship between sleep quality and health-promoting behaviors in the elderlies

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Original Article

Abstract

BACKGROUND: Aging is associated with a wide range of sleep complaints. Health-promoting behaviors are the most important and effective factor in maintaining and improving the health of the elderly. The present research aims to investigate the relationship between sleep quality and health-promoting behaviors in older people.

METHODS: This descriptive correlational research was conducted in Imam Khomeini Hospital affiliated to Shahid Beheshti University of Medical Sciences, Firozkoh City, Tehran Province, Iran, in 2020. 384 old people were selected by available sampling. For data collection, the hospital information system (HIS), health-promoting lifestyle profile II (HPLP-II), and Pittsburgh Sleep Quality Index (PSQI) were used. Data were analyzed using a t-test and Pearson's correlation coefficient by SPSS software.

RESULTS: The highest frequency was related to people with bad sleep quality (72%). Sleep quality had a significant correlation with nutrition (r = -0.129, P = 0.010), stress management (r = -0.096, P = 0.058), and health-promoting behaviors (r = -0.128, P = 0.001). There was an inverse correlation between taking responsibility for health, physical activity, interpersonal relationships, and spiritual growth with sleep quality, but it was not statistically significant (P = 0.560).

CONCLUSION: Health-promoting behaviors depend on a deep link with the sleep quality index, and it is necessary to emphasize sleep quality and other factors of appropriate health-promoting behaviors in the elderly more than anything else.

KEYWORDS: Sleep Quality; Health Promoting; Elderly

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Introduction

Although aging has developed rapidly in developed countries, less developed regions experience this phenomenon faster and in a shorter period.[1] United Nations (UN) and World Health Organization (WHO) estimates show that by 2030, the elderly population in the world will increase from 9% to 16% and in Iran, from 6.5% to 17.5%.[2] It is predicted that by 2030, the number of people aged 65 and over, which was one billion people in 2019, will reach 1.4 billion people with a 34% increase.[3] In Iran, the last census of the country in 2015 shows the share of elderly people aged 60 and over as 3.9%, which has been increasing. This increase can be seen in both urban and rural areas; in 2015, more than 10% of the rural population were 60 years old and older, and this ratio was 1.9% in urban areas.[6,7] According to the classification of the WHO, there are three groups of young elderly,

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elderly, and old elderly.[8] In Iran, more than 70% of the elderly are young, and in rural areas, the share of elderly people is higher than in urban areas. About 25% of Iran's elderly are elderly and only 2.2% are old and sick.[7] One of the most important health issues that are emphasized in these patterns is the general health of the elderly. Increased susceptibility to infections, and the increase in the incidence of malignancies and cancer in the elderly population, is due to a decrease in the basic physiological function of the elderly's immune system.[6] The results of studies by many researchers indicate that there is a positive and significant relationship between old age and sleep quality. According to the statistics of the National Sleep Foundation in 2003, at least 46% of adults aged 65-74 suffered from insomnia symptoms.[8,9] Thichumpa et al. showed that inadequate amount of sleep could cause the activation of genes related to depression.[10] The results of Carleton et al. state that the findings related to demographic factors, gender, and age indicate a greater frequency of sleep problems in women and people over the age of 60,[11] which is a consistent finding in most sleep-related research. Garbarino et al. reported that aging process was associated with subjective and objective changes in the quality and quantity of sleep. People over 65 years of age suffer from insomnia significantly, especially if they suffer from physical and mental problems. Research results show that 49% of depressed patients aged 20 to 30 and 75% of people aged 50 to 65 and above complain of disturbed sleep.[12] Sleep disorder produces a permanent cycle, sleep disturbance, increasing problems, and psychosomatic problems.[13]

Health-promoting behaviors are one of the main criteria for determining health and are known as a background factor in not contracting many diseases. Health-promoting behaviors in the elderly have a potential effect on promoting their health and will reduce healthcare costs. Therefore, according to the mentioned requirements and also due to the close interaction of the research related to the elderly and the close touch of their problems, especially the problems related to sleep, the researchers of the present study decided to research to determine the relationship between sleep quality and health-promoting behaviors in the elderly who referred to the hospital affiliated to the Shahid Beheshti University of Medical Sciences, Tehran, Iran, in 2020.

Methods

This correlational descriptive research was conducted in Imam Khomeini (RA) Hospital, Firozkoh City, Tehran Province, affiliated to Shahid Beheshti University of Medical Sciences, in 2020.

The required sample size at the significance level, $p_1 = 0.5$, $d = 0.005$, $q_1 = 0.5$, and $Z = 1.96$, after the quantification in the sample size formula, was considered 384.

$$p_1 = 0.5 \quad q_1 = 0.5$$
$$Z = 1.96 \quad d = 0.005$$
$$A = \frac{Z2pq}{d2} = \frac{(1.96 \times 1.96)(0.5 \times 0.5)}{(0.05 \times 0.05)} = \frac{3.84 \times 0.25}{0.0025} = \frac{0.96}{0.0025} = 384$$
$$n = \frac{\frac{Z^2 pq}{d^2}}{1 + \frac{1}{N}\left(\frac{Z^2 pq}{d^2} - 1\right)} \quad N = 1 + \frac{1}{384} = (384 - 1) = 384$$

Inclusion criteria were: not having a history of participating in similar research, willingness to participate in the research, being able to communicate orally in the Persian language, and being over 60 years old. Exclusion criteria in this study were unwillingness to continue cooperation during the study and non-completion of questionnaires.

People referred to the hospital were selected using convenience sampling. The data collection tool in this research included three sections of demographic information, the standard Pittsburgh Sleep Quality Index (PSQI), and the health-promoting lifestyle profile II (HPLP-II) international questionnaire

to measure the extent to which adults engage in a health-promoting lifestyle presented hereof health-promoting, and this questionnaire contains statements about people present way of life or personal habits. The process of sampling, distributing, and collecting questionnaires was done by the researcher.

In this research, there were two researchers started the research after obtaining permission and a code from the ethics committee and presenting a letter of introduction to the heads of the hospital, as well as obtaining permission from the research samples, introducing themselves to the people, and telling them the research objectives.

At first, the researchers selected the desired samples who met the inclusion criteria using convenience sampling, and after obtaining written consent from them, the demographic information questionnaire, HPLP enhancing behavior questionnaire, and PSQI were completed by them.[14,15]

Data from the collected questionnaires were entered into the SPSS software (version 26, IBM Corporation, Armonk, NY, USA). Using descriptive (frequency and percentage), non-parametric statistical tests, t-tests, and Pearson's correlation coefficient test (for determining the relationship between demographic variables and the total score of health-promoting behaviors), analysis was performed (Ethics code: IR.IAU.TMU.REC.1400.240).

Based on the results of a one-way analysis of variance (ANOVA), there was a positive and significant relationship between the total score of health-promoting behaviors and the level of education of the studied samples, so that the higher the level of education, the more the health-promoting behaviors, especially in the field of nutrition and physical activity.

Results

The highest frequency in the case of gender was related to women (n = 282, 70.5%) (men: n = 118, 29.5%).

The highest frequency in the case of age (n = 195, 148.7%) was related to the age of 71-75 years old and the lowest frequency (n = 11, 2.8%) was related to over 80 years old. Moreover, 86.8% of the people (n = 347) were married people, and the lowest frequency (n = 3, 0.8%) was related to divorced people. The highest frequency (n = 232, 58.0%) of people had a diploma education and the lowest frequency (n = 19, 4.7%) was related to primary education and lower.

The highest frequency (n = 121, 30.3%) in the case of job situation was related to retired people. The lowest frequency (n = 19, 4.8%) was related to the unemployed. Besides, the highest and the lowest frequencies related to other variables were as follows: insufficient income level (n = 369, 92.3%) versus completely sufficient income (n = 5, 1.3%), private homes (n = 280, 70.0%) versus others (n = 21, 3.5%), social security insurance (n = 327, 81.8%) versus other types of insurance (n = 2, 0.5%).

The highest frequency was related to poor sleep quality (n = 290, 72%) versus good sleep quality (n = 110, 28%); means PSQI, a total score greater than 5 indicates that the samples have inadequate and little sleep and have severe problems, at least in two areas, or have problems are average in more than 3 areas.

The research results showed that mean subjective quality of sleep was 1.13 ± 0.88, delay in falling asleep was 1.01 ± 1.32, sleep duration was 0.93 ± 1.16, sleep efficiency was 1.03 ± 0.90, sleep disturbance was 0.68 ± 1.45, use of sleeping pills was 1.13 ± 0.72, daily dysfunction was 1.10 ± 9.84, and the mean of general components of sleep quality was 0.10 ± 97.98 (Table 1).

Mean and standard deviation (SD) of nutrition was 25.2 ± 3.7, physical activity was 14.5 ± 4.4, health responsibility was 4.2 ± 20.7, stress management was 2.7 ± 20.3, interpersonal support was 3.6 ± 25.4, and spiritual development area was 3.7 ± 24.3; in addition, the mean and SD of the total score of health-promoting behaviors was 15.2 ± 130.5 (Table 2).

Table 1. The mean and standard deviation (SD) of the sleep quality components of the elderly

Row	Components of sleep quality	Mean ± SD
1	Quality of sleep	1.13 ± 0.88
2	Delay in falling asleep	1.01 ± 1.32
3	Sleep duration	0.93 ± 1.16
4	Sleep efficiency	1.03 ± 0.90
5	Sleep disturbance	0.68 ± 1.45
6	Use of sleeping pills	1.13 ± 0.72
7	Daily dysfunction	1.10 ± 9.84
8	Components of sleep quality	0.10 ± 97.98

SD: Standard deviation

According to the results of the Pearson correlation test, between the total score of sleep quality with nutrition (r = -0.129, P = 0.010), stress management (r = -0.096, P = 0.058), and the total score of health-promoting behaviors (r = -0.128, P = 0.001), there was an inverse and significant correlation.

Table 2. The mean and standard deviation (SD) of the variable of health-promoting behaviors according to subgroups

Row	Health-promoting behaviors	Mean ± SD
1	Nutrition	25.0 ± 3.7
2	Physical activity	14.5 ± 4.4
3	Health responsibility	4.2 ± 20.7
4	Stress management	2.7 ± 20.3
5	Interpersonal support	3.6 ± 25.4
6	Spiritual development	3.7 ± 24.3
Total score		15.2 ± 130.5

SD: Standard deviation

Besides, there was an inverse correlation between responsibility towards health, physical activity, interpersonal relationships, and spiritual development with the total sleep quality score, but it was not statistically significant (P = 0.56) (Table 3).

Table 3. Correlation of sleep quality scores with dimensions of health-promoting behaviors in the studied subjects

Row	Health-promoting behaviors	r	P
1	Nutrition	-0.129	0.010
2	Physical activity	-0.068	0.220
3	Health responsibility	0.061	0.129
4	Stress management	-0.096	0.058
5	Interpersonal support	-0.164	0.001
6	Spiritual development	-0.073	0.088
Total score			-0.128

Discussion

In this study, the relationship between sleep quality and health-promoting behaviors in the elderly was determined. The highest frequency was related to bad sleep quality. Besides, the highest frequencies in the case of gender was related to women aged 71-75 years old. The present research results are consistent with the results of the study by Moudi et al., which showed that older women were widely reported to have poor sleep quality and sleep problems. It is unclear whether the increase in sleep disturbance is due to hormonal changes associated with menopause or psychosocial and physical problems. Postmenopausal women were at high risk for poor sleep quality. Physical activity dimensions of lifestyle, non-smoking status, and occupation were associated with sleep quality.[16] But in our study, physical activity was not associated with sleep quality. Contrary to the results of the current research, the results of Wang and Boros research proved the relationship between physical activities and sleep quality in young adults.[17] There was a positive and significant relationship between health-promoting behaviors and physical activity, perhaps the reason for this difference is the age of the sample because in the mentioned research, the age group of 19 to 39 years old was considered, but in the present study, the research samples were from the age group above 60 years old. Sharifi et al. investigated the relationship between the quality of sleep and the quality of life of the retired elderly.[18] The average sleep quality score of the elderly showed that their sleep quality was poor; besides, in our study, the highest frequency was related to poor sleep quality (72%). In Sharifi et al. study, there was a positive and significant correlation between sleep quality and the retired elderly; in our study also the highest frequency (30.3%) was related to the retired elderly. Poor sleep quality in retired elderly people is more than the others.[18]

Furthermore, the results of Capezuti research revealed that when people suffered from insomnia, their daily performance was disturbed, for example, nutrition, interpersonal support, and health-promoting behaviors in the results of the current research were associated with poor sleep quality.[19] Our results show that the highest score of dimensions of health-promoting behaviors is related to sleep quality. According to Homaei and Pooyanmehr study, sleep quality and health-promoting lifestyle were related to gender. Social adjustment and life expectancy can be enhanced through the amplification of sleep quality and health-promoting lifestyle.[20] In the present study, the highest score of dimensions of health-promoting behaviors was related to spiritual growth and responsibility towards health. In the study of Varvogli and Darviri, the dimensions of health-promoting behaviors, including spiritual growth and responsibility for health, had the highest score,[21] which is in line with the present research. Gyasi reported social support, physical activity, and mental and emotional stress among the elderly,[22] which are in line with the present research.

In the current study, there was an inverse and significant correlation between the total score of sleep quality with nutrition, stress management, and the total score of health-promoting behaviors, so that with the increase in the score of nutrition, stress management, and the total score of health-promoting behaviors, the total score of sleep quality decreased; this relationship means good sleep quality. Therefore, according to the results of this study, the use of healthy food can improve the quality of sleep in the elderly. Stress management includes matching and adapting to solve problems and stressors in life, which can increase people's abilities to face problems. In addition, the number of hours people sleep is also a sign of stress management. Lack of sleep reduces a person's resistance to disease and also reduces his physical, mental, social, and psychological performance.[23] Stress management and sleep have a mutual relationship so that with a decrease in sleep, stress management is also reduced in a person and the person experiences provocative behaviors. In addition, if stress management is reduced, it affects the amount and quality of sleep and makes the person out of the normal state.[24]

The appropriate solutions are to eliminate the problems, especially if the existing problem is related to the health and the health team; the health team and one of its important elements, the nurse, due to their close relationship with patients and clients, can provide solutions for use. Health-promoting behaviors depend on a deep link with the sleep quality index, and it is necessary to emphasize sleep quality and other factors of appropriate health-promoting behaviors in the elderly more than anything else. Since the quality of sleep is related to the performance of health-promoting behaviors, this point can be considered an important factor in the health of people, especially the elderly, and plays an important role in reducing their pathogenicity. On the other hand, a society whose people have good health will show better conditions of health in different dimensions and this issue can affect their performance, families, and social institutions responsible for health. It is also one of the important axes of assessing the health of sleep and its quality, which plays an important role in ensuring the dynamics and efficiency of people.

The limitations of the present study were as follows. Because of the conditions of the coronavirus disease 2019 (COVID-19) transmission, the researcher was extremely careful in observing social distancing, using a mask, and washing and disinfecting hands before and after presenting the questionnaire to the research samples. The unwillingness of the research samples to participate in the

research was another limitation, for which the necessary explanations were given to them to attract cooperation. The mental state of the research samples while answering the questions of the questionnaire was also out of the researcher's control. Considering a control group and investigating different socio-cultural backgrounds is suggested.

Conclusion

Considering the significant relationship observed between health-promoting behaviors and sleep quality of the elderly, and since sleep problems during this period can easily threaten the health of the elderly, it is potentially important to consider health-promoting behaviors in the elderly. Therefore, it is recommended that plans be considered to increase health, improve medical and health services, and provide counseling services to the elderly population.

Conflict of Interests

Authors have no conflict of interests.

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